Claims

1. A method for regulating power of an output optical signal of an optical transmitter, said method comprising the steps of:

sensing optical energy proximate a back facet of said optical transmitter;

sensing thermal energy proximate said optical transmitter, wherein:

sensed thermal energy is indicative of a tracking error of said optical transmitter; and

said tracking error is indicative of a temperature difference between said back facet and a front facet of said optical transmitter and a change in coupling efficiency within said optical transmitter; and

regulating said power of said output optical signal in response to said sensed thermal energy and said sensed optical energy.

2. A method in accordance with claim 1, wherein said power of said output optical signal is regulated to be approximately constant for a predetermined range of temperature values of said sensed thermal energy.

3. A method in accordance with claim 1, wherein said optical transmitter is an uncooled optical transmitter.

4. A method in accordance with claim 1, further comprising:

providing a detected temperature signal indicative of temperature values of said sensed thermal energy to a temperature controlled variable resistor (TCVR), wherein:

resistance values of said TCVR correspond to respective temperature values of said sensed thermal energy; and

providing a temperature control signal indicative of a selected TCVR resistance value corresponding to a current temperature value of said sensed thermal energy for regulating said power of said output optical signal.

5. A method in accordance with claim 4, wherein said TCVR comprises:

a plurality of TCVR resistance values, each TCVR resistance value corresponding to a respective range of sensed temperature values.

6. A method in accordance with claim 4, further comprising:

determining values of said power of said output optical signal of said optical transmitter at predetermined temperature values;

determining a respective temperature control resistance value for each predetermined temperature value to obtain a predetermined value of power of said output optical signal;

interpolating said temperature control resistance values over a selected range of temperature values for obtaining said plurality of TCVR resistance values; and

mapping each of said plurality of TCVR resistance values to a respective range of sensed temperature values.

7. A method in accordance with claim 6, wherein said predetermined temperature values comprise -40°C, 25°C, and 85°C.

8. An apparatus for regulating power of an output optical signal of an optical transmitter, said apparatus comprising:

an optical sensing portion for sensing optical energy at a back facet of said optical transmitter;

a thermal sensing portion for sensing thermal energy proximate said optical transmitter; and

a power control portion for adjusting said power of said output optical signal responsive to said sensed optical energy and said sensed thermal energy, wherein:

a temperature value of said sensed thermal energy is indicative of a tracking error of said optical transmitter.

9. An apparatus in accordance with claim 8, wherein said tracking error is indicative of:

a temperature difference between said back facet of said optical transmitter and a front facet of said optical transmitter; and

a change in coupling efficiency within said optical transmitter.

10. An apparatus in accordance with claim 8, wherein said optical transmitter is an uncooled optical transmitter.

11. An apparatus in accordance with claim 8, wherein said power of said output optical signal is regulated to be approximately constant for sensed temperature values within a predetermined range of temperature values of said sensed thermal energy.

12. An apparatus in accordance with claim 8, further comprising a temperature controlled variable resistor (TCVR) for receiving a temperature control signal indicative of temperature values of said sensed thermal energy, wherein:

said TCVR comprises a plurality of TCVR resistance values, each TCVR resistance value corresponding to a respective range of sensed temperature values.

13. A circuit for regulating power of an output optical signal of an optical transmitter, said circuit comprising:

said optical transmitter optically coupled to a photo diode;

said photo diode electrically coupled to said optical transmitter and electrically coupled to a temperature controlled variable resistor (TCVR);

a temperature sensor thermally coupled to said optical transmitter; and

said TCVR electrically coupled to said temperature sensor, wherein:

said output optical power is regulated to be approximately constant for a predetermined range of temperature values compensating for coupling efficiencies and temperature differences within said optical transmitter.

14. A circuit for regulating power of an output optical signal of an optical transmitter, said circuit comprising:

an optical transmitter configured to:

receive a composite control signal for regulating said output optical power;

provide an output optical signal having an output optical power value; and

provide back coupled optical energy,

a photo diode configured to:

detect a portion of said back coupled optical energy; and

and provide a photo diode control signal indicative of detected back coupled optical energy;

a temperature sensor configured to:

sense thermal energy proximate said optical transmitter; and

provide a detected temperature signal indicative of sensed thermal energy;

a temperature controlled variable resistor (TCVR) configured:

receive said detected temperature signal; and

provide a temperature control signal, wherein:

said composite control signal is indicative of a combination of said temperature control signal and said photo diode control signal.

15. A circuit in accordance with claim 14, wherein said power of said output optical signal is regulated to be approximately constant for a predetermined range of temperature values compensating for coupling efficiencies and temperature differences within said optical transmitter.

16. A circuit in accordance with claim 14, wherein said optical transmitter is an uncooled optical transmitter.

17. A circuit in accordance with claim 16, wherein said TCVR comprises a plurality of TCVR resistance values, each TCVR resistance value corresponding to a respective range of detected temperature values of said sensed thermal energy.

18. A circuit in accordance with claim 17, wherein said TCVR resistance values are interpolated from a set of pre-interpolated TCVR resistance values determined to obtain a predetermined value of optical output power.

19. A computer readable medium encoded with a computer program code for directing a processor to regulate power of an output optical signal of an optical transmitter, said program code comprising:

a first code segment for causing said processor to cause an optical sensor to sense optical energy proximate a back facet of said optical transmitter;

a second code segment for causing said processor to cause a thermal sensor to sense thermal energy proximate said optical transmitter, wherein:

sensed thermal energy is indicative of a tracking error of said optical transmitter; and

a third code segment for causing said processor to regulate said power of said output optical signal in response to said sensed thermal energy and said sensed optical energy.